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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/510,861	02/23/2000	Koichi Tamura	13392	4715

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EXAMINER
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FAN, CHIEH M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 06/21/2004

16

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/510,861

Applicant(s)

TAMURA, KOICHI

Examiner

Chieh M Fan

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.  
4a) Of the above claim(s) 11-14, 25-28 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-10, 15-24 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 23 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This Office Action is in response to the latest amendment filed on 3/19/04.

1. The applicant listed claims 11-14 and 25-28 as "original" in the amendment filed 3/19/04. The applicant is reminded claims 11-14 and 25-28 are non-elected claims and should be listed as "withdrawn" or "cancelled" instead of "original".

### *Claim Objections*

2. Claims 6-8, 10 and 15-24 are objected to because of the following informalities:

Regarding claim 6, it appears that " $\Delta\theta*n$ " in line 3 should be changed to --  $\Delta\theta_n$  --, and the variable "n" should be defined.

Regarding claim 7, said known signal for transmission" in line 2 of claim 7 should be changed to --- said known signal inserted at transmission ---.

Regarding claim 10, "base band singles" in line 2 should be changed to – base band signals --.

Regarding claim 15, "the sampling frequency minimized" in line 14 (line 2 from the bottom) should be changed to --- the sampling frequency is minimized ---.

Regarding claim 16, "said two A/D converters" in line 6 should be changed to --- two A/D converters ---, and "comparing a known signal" in lines 6-7 should be changed to --- comparing the known signal ---.

Regarding claim 17, "said two A/D converters" in line 10 should be changed to --- two A/D converters ---.

Regarding claim 20, it appears that " $\Delta\theta^n$ " in line 4 should be changed to --  $\Delta\theta_n$  --, and the variable "n" should be defined.

Regarding claim 24, "said known single" in line 3 should be changed to --- said known signal ---.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-10 and 15-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding each of the independent claims 1, 3, 15 and 17, the examiner does not believe the limitation "the sampling frequency is minimized or lowered by said phase shift" is supported by the specification. In particular, the present invention is directed to compensate the offset from the desired sampling point using phase shift such that the

sampling frequency does not need to be increased to achieve optimal sampling. That is, the current sampling frequency is maintained. However, the specification never teaches that the sampling frequency of the A/D converters may be minimized or lowered by the process of phase shifting as claimed. As shown in Fig. 1, the A/D converters 7 and 8 never receive any control signals from the phase shift control portion 14. In fact, the A/D converters never receive any control signals at all to change the sampling frequency. Similarly, the specification only teaches the phase shift prevent the increase of the sampling frequency, which consequently prevents the increase of the power consumption level. The specification never teaches the power consumption level may be reduced. Therefore, the claimed “the power consumption level is reduced” would not be enabled by the specification.

Regarding claim 5, independent claim 1 recites “phase shifting means for causing phase shift of one of said digital transmission signal and said base band signal...” in lines 9-10 and claim 2 recites “a phase shifter for causing phase shift of said base band (signal) ... “ in lines 15-16. On the other hand, claim 5 recites “said phase shifter causes phase shift of said digital transmission signal...” in lines 2-3. The limitation recited in claim 5 results in the phase shift of both the digital transmission and the base band signal, which clearly contradicts the limitation recited in claim 1. Further, the specification of the present application never teaches both the digital transmission and the base band signal are phase shifted.

Claim 19 is a corresponding method claim of claim 5, and is rejected for the same reason above.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-10 and 15-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, claim 1 recites "the sampling frequency is minimized or lowered by said phase shift" in line 14 (line 2 from the bottom), but never mentions anything to be compared with the sampling frequency to define "lowered". The scope of the claim is therefore indefinite.

Regarding claim 3, claim 3 recites the limitation "said phase shifting means" in line 14. There is insufficient antecedent basis for this limitation in the claim. Further, claim 3 recites "the sampling frequency is minimized or lowered by said phase shift" in line 21 (line 2 from the bottom), but never mentions anything to be compared with the sampling frequency to define "lowered". The scope of the claim is therefore indefinite.

Regarding claim 6, claim 6 recites the limitation "said comparison means" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. Further, claim 6 recites "modifies shift amounts of a plurality of phase shift elements for 1-N times (in which N is an integer greater than or equal to two)" in lines 2-3. Since N is greater or equal to two, the value of 1-N is negative. It is not clear how to modify shifting amounts for a negative number of times.

Regarding claim 15, claim 15 recites “the sampling frequency is minimized or lowered by said phase shift” in line 14 (line 2 from the bottom), but never mentions anything to be compared with the sampling frequency to define “lowered”. The scope of the claim is therefore indefinite.

Regarding claim 17, claim 17 recites the limitation “said third step” in lines 8-9. There is insufficient antecedent basis for this limitation in the claim. Further, claim 17 recites “the sampling frequency is minimized or lowered by said phase shift” in line 19 (line 2 from the bottom), but never mentions anything to be compared with the sampling frequency to define “lowered”. The scope of the claim is therefore indefinite.

Regarding claim 20, claim 20 recites “modifying shift amounts of a plurality of phase shift elements for 1-N times (in which N is an integer greater than or equal to two)” in lines 2-3. Since N is greater or equal to two, the value of 1-N is negative. It is not clear how to modify shifting amounts for a negative number of times.

Regarding claim 21, the limitation “a correlation value of said known signal for transmission and said known inserted at transmission and said known signal after digital conversion becomes the highest” in lines 2-4 is not understood. It is not clear how to correlate three signals. The applicant is also invited to indicate which portion of the specification that supports the claimed limitation.

Regarding claim 22, the limitation “said steps (b) through (d) is repeated for detecting phase amount to be shifted based on the result of comparison for N times for M times” in lines 1-3 is not understood (emphasis added). The applicant is also invited

to indicate which portion of the specification that teaches the steps (b) through (d) are repeated for N time for M times.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The following rejection is based on the examiner's best understanding of the invention.

8. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinagawa et al. (JP 07-297870, provided by the applicant in the IDS filed 5/14/01, USPTO Paper#5) in view of Bruekers et al. (U.S. Patent No. 5,784,414).

Since the reference Shinagawa is provided by the applicant, the examiner assumes the translation is available to the applicant. Otherwise, the applicant may obtain the translation from the Japanese Patent Office web page as the examiner does. For the applicant's convenience, a copy of English abstract is attached in this Office Action.

Regarding claim 1, Shinagawa teaches a demodulation circuit for demodulating a digital transmission signal (see abstract), wherein



a known signal is inserted in said digital transmission signal at transmission (10 in Fig. 1);

and said demodulator circuit comprising:

A/D converting means (6, 7 in Fig. 1) for performing A/D conversion of a baseband signal obtained by demodulation (4 in Fig. 1) of said digital transmission signal; and

Phase shifting means (13 in Fig. 1) for repeatedly varying a phase shift of one of the digital transmission signal or the baseband signal on the basis of a comparison (9, 11, 12 in Fig. 1) between said known signal after digital conversion (6, 7 in Fig. 1) and prior to a P/S conversion (16 in Fig. 1) and said known signal that was inserted at the transmission (10 in Fig. 1).

Shinagawa does not explicitly teach that the sampling frequency does not have to be increased because of the phase shift, and consequently the power consumption level does not need to be increased.

However, the difference is clearly only directed to the advantage of the demodulation circuit. Although Shinagawa does not specifically point out the claimed advantage, Shinagawa's circuit clearly would achieve the same benefit since Shinagawa's circuit has the same circuit structure as claimed. The applicant is reminded that the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). As shown in Fig. 1 of Shinagawa, the

optimal sampling points are obtained by performing phase-shifting in the phase compensation circuit 13 without the need of increasing the sampling frequency of the A/D converters 6 and 7. The A/D converters never receive any control signals to adjust the sampling frequency. Further, it is well known that the increase of sampling frequency causes the increase of power consumption level. Bruekers et al. teach that there are penalties on increasing sampling frequency, such as an increase in power consumption of the digital circuitry (col. 4, lines 6-8). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that Shinagawa's circuit would achieve the benefit of not increasing power consumption level, since Shinagawa's circuit does not need to increase the sampling frequency for desired sampling points.

Regarding claim 15, claim 15 is the corresponding method claim of claim 1 and is therefore rejected for the same reason above.

9. Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinagawa et al. (JP 07-297870, provided by the applicant in the IDS filed 5/14/01, USPTO Paper#5) in view of Bruekers et al. (U.S. Patent No. 5,784,414) as applied to claims 1 and 15 above, and further in view of Matsuoka et al. (U.S. Patent No. 5,809,009).

As described above, Shinagawa in view of Bruekers teaches a TDMA system including all the claimed subject matters, but does not particularly point out the information data and the known signal are time multiplexed. However, it is common in

the art that the information data and the known signal are time multiplexed to form the transmission signal so as to use the known signal to periodically synchronize the receiver with the transmitter. Matsuoka teaches a TDM system in which the information data and the known signal are time multiplexed to form transmission signal (col. 10, lines 50-55). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to time-multiplex the information data and the known signal, so as to use the known signal to periodically synchronize the receiver with the transmitter.

### ***Response to Arguments***

10. Applicant's arguments filed 3/19/04 with respect to the rejection of claims 5 and 19 under 35 USC 112, first paragraph have been fully considered but they are not persuasive.

In particular, the applicant argues that claim 5 further limits the limitation recited in claim 1 to phase shifting the digital transmission signal (see page 18 of the amendment). In response to the applicant's argument, the applicant is reminded claim 5 depends on claim 2, not claim 1. More specifically, claim 1 recites that the phase shift means causes a phase shift of one of the digital transmission signal and the baseband signal. Claim 2, on which claim 5 depends, further limits the limitation recited in claim 1 to phase shifting the baseband signal, which implies that the digital transmission signal is not phase shifted. On the other hand, as admitted by the applicant, claim 5 again

further phase-shifts the digital transmission signal. Therefore, the limitation recited in claim 5 (and claim 19) clearly contradicts its parent claims (claims 1+2).

11. Applicant's arguments with respect to claims 1, 9, 15 and 23 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***


12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Chieh M Fan  
Primary Examiner  
Art Unit 2634

June 4, 2004